Thrust: Human-Centric Design of Collaborative Interfaces

- **Unresolved research issues/challenges**:
  - Need a taxonomy (working definitions) of **shared cognition** so we can embed it into interface artifacts
    - shared intent/goal congruence
    - shared situation awareness
    - (un)shared processes losses/gains
    - interaction/coordination
    - unit of analysis

Shared
Overlapping
Similar
Compatible
Distributed

- **Define operational target**

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- **Promising Technologies:**
  - Augmented/Annotated Overlays
    - Text, Graphic, Audio, Animated, Video
  - Measure of cognitive load
    - Passive pupil dilation (Marshall et al., etc)
    - Emotion mouse (Chin & Crosby, etc.)

- **Technology Issue:**
  - Bandwidth (Low vs High vs Backup)
  - Preserving what we can as it decreases

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- **Underlying science/concepts/tools:**
  - Theory of Collaborative Breakdown
  - Theory of Cognitive Overload
  - Theory of Interruption
  - Representations of Intent
  - Representations of Rationale

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- **Metrics & Measures of Effectiveness:**
  - $\text{Interface}_1 > \text{Interface}_2$ wrt measure of
    - Performance
    - Non-performance
      - Internal state
      - Formal computational
      - …
    - Social/Organizational